EPA & Pavillion - Dec. 15 to 20

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12/17/2012	Colorado Oil And Gas Industry Under Pressure As Protests Mount	Huffington Post, The
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Fracking and Water Contamination
CleanTechnica

12/19/2012

A group of researchers from Penn State University has uncovered a new issue for fracking, the natural gas drilling method that involves pumping a pressurized mix of water, chemicals, and other substances thousands of feet underground. Until now, one major focus of concern has been fracking water contaminationfrom chemicals in the original fluid. The new twist, according to the research team, is that the spent fluid comes back laden with a brine containing elements that have been locked beneath the earth for hundreds of millions of years dating back to the Paleozoic era. With elements like barium and radium in the mix, the end result could be costly new regulations for the transportation and disposal of fracking brine, and new headaches for the fracking industry.

Under the Obama Administration, the U.S. EPA has been moving toward tighter regulations for the fracking industry. Progress has been slow partly because fracking was exempted from federal regulation under the Clean Water Act, and drillers were entitled to keep the ingredients in fracking fluid a secret.

The notorious case of drinking water contamination in Pavillion, Wyoming is one example of the difficulty faced by EPA investigators in confirming the connection between fracking and specific instances of water contamination. However, anecdotal evidence has been steadily mounting that contaminants in the original fracking fluid, as well as escaped gas, have been entering drinking water wells.

The Penn State team looked at another aspect of the operation, which is what happens to the spent fracking fluid after the drilling operation.

Prehistoric Elements in Fracking Brine

The research paper is available online at Applied Geochemistry. It covers flowback from fracking operations in the Marcellus region, which covers heavily populated areas in the Northeast including Pennsylvania, New York, and New Jersey.

The research team used four different sources of data covering Marcellus wells, primarily in Pennsylvania. That included one group of conventional oil and gas wells, and three groups of gas fracking wells.

According to the study, in a typical fracking operation, only about one-quarter of the original fracking fluid returns to the surface. The study found that a major component of this fluid was a highly saline brine, which was not consistent with the salinity of the original fracking fluid.

The high levels of salinity, though, were consistent with deposits during the Paleozoic era, which also include naturally occurring barium and radium.

Though the ancient elements are highly diluted, the study concludes that the levels are high enough to be out of compliance with drinking water standards, with consequent implications for the safe handling and disposal of flowback water.

The Hidden Cost of Fracking

Fossil fuels are popular because they are relatively cheap. However, there is no such thing as a free lunch. When public health and environmental issues are factored in, costs begin to mount and the luster begins to fade.

In addition to water contamination issues, a recent study by Cornell University suggests that the fracking industry will eventually need to address the amount of greenhouse gas emitted during fracking operations, in the form of methane gas leakage.

Earthquake risks are another consideration, as are other local effects including new traffic patterns (primarily due to heavy truck traffic) and the potential loss of value for farmland and other nearby properties.

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Fracking is nothing new, by the way. It has been flying under the radar for years, primarily because it was mainly located in sparsely populated areas.

Now that fracking is taking place in heavily populated regions, more people are immediately affected and public awareness is growing.

A recent documentary by Josh Fox on fracking in Pennsylvania called Gasland has helped to push the local effects of fracking into the spotlight. Director Gus Van Sant's soon-to-be released major motion picture Promised Land (also set in Pennsylvania) will most likely intensify the focus, thanks partly to the star power of leads Matt Damon, John Krasinski, and Frances McDormand.

(Note: For those of you keeping score at home, the dinosaur pictured above is not from the Paleozoic era.)

Image: Dinosaur by InfoMofo

Follow me on Twitter: @TinaMCasey

About Tina Casey

Tina Casey specializes in military and corporate sustainability, advanced technology, emerging materials, biofuels, and water and wastewater issues. She is a regular contributor to Cleantechnica.com and TriplePundit.com, and has contributed to IdeaLab.Talkingpointsmemo.com. She is currently Deputy Director of Public Information for the County of Union, New Jersey. Tina's articles are reposted frequently on Reuters, Scientific American, and many other sites. You can also follow her on twitter @TinaMCasey, and on Tumblr. Her professional background includes three years as Deputy Director of Public Affairs for the New York City Department of Environmental Protection, and two years as a researcher for the city's Department of Consumer Affairs.

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EPA URGED TO EXPAND FRACKING STUDY'S FOCUS ON WASTEWATER DISPOSAL RISKS
Inside EPA Weekly Report

12/18/2012

Environmentalists are urging EPA to broaden its pending assessment of the risks posed by wastewater disposal from hydraulic fracturing, saying the agency's pending study on the risks posed by fracking to drinking water resources should include controversial disposal to underground reservoirs, where the majority of wastewater from the industry is disposed, rather than just the limited releases to treatment facilities that EPA is currently reviewing.

An EPA spokeswoman says that while the agency recognizes that wastewater disposal to underground injection wells is an important issue, it is not within the current scope of the study.

That research could eventually bolster environmentalists' calls to strengthen EPA rules governing underground injection of wastewater from oil and gas drilling operations, which is currently exempt from strict hazardous-waste-disposal requirements.

During a recent series of discussions EPA is holding ahead of the interim report's release the week of Dec. 17, environmentalists revived the question of what type of wastewater disposal issues the agency should be studying, according to an environmentalist familiar with the meetings. "People said [EPA] should be looking more broadly at how much waste" is being generated, as well as "where trends are going" for management and disposal of those wastes, the source adds.

The source says EPA officials acknowledged that the majority of wastewater -- at least 90 percent -- gets injected to underground disposal wells, but also that it was outside the scope of the current study, and that while it warranted further discussion, budget constraints would likely hinder the agency's ability to examine those impacts in the two-year study.

"With the current study, they're not really looking at that," but "there's interest in where the wastewater is actually going," the source says.

EPA and others suggested that the agency could seek to study potential impacts associated with disposal wells in the context of planned research it intends to do in collaboration with the departments of Interior and Energy under a pact outlining how the agencies would align research on environmental and safety issues related to fracking.

Many observers have long been concerned that produced water discharges from fracking operations contain a host of pollutants that are contaminating surface water resources.

But EPA's pending study on the risks posed by fracking to drinking water resources -- an interim version of which is slated for release the week of Dec. 17 -- is examining only whether there is inadequate treatment at municipal and industrial treatment facilities for wastewater from fracking.

EPA's study generally seeks to analyze five phases of the water cycle associated with fracking: water acquisition; chemical mixing; well injection; flowback and produced water; and wastewater treatment. The study is comprised of retrospective and prospective case studies at fracking sites, in addition to literature review, laboratory analysis and other types of research.

The agency Nov. 14-16 held roundtables on each of the five water cycle phases of its two-year fracking study, slated for completion in 2014, for the purpose of flagging issues for more in-depth discussions at an upcoming series of technical workshops.

The wastewater phase of the study, discussed during a Nov. 16 meeting, seeks to examine "[w]hat are the possible impacts of inadequate treatment of hydraulic fracturing wastewater on drinking water resources?"

Industry groups have questioned the need for the study to examine potential impacts associated with wastewater treatment processes. For example, America's Natural Gas Alliance (ANGA) said in comments submitted last May to EPA's Science Advisory Board panel that was charged with reviewing the study plan that the portion of hydraulic fracturing wastewaters that are processed through treatment facilities will continue to diminish. "Consequently, it would

make little sense to focus limited time and resources on those questions," ANGA said.

But according to documents that the agency released Dec. 11 and that were presented during the Nov. 16 meeting, the study is focusing on the efficacy of treatment processes because "discharge of treated wastewater to surface waters provides an opportunity for chemicals found in the effluent to be transported to downstream drinking water intakes." The study will also examine some treatment processes associated with reusing fracking wastewater, the documents say. The documents are available on InsideEPA.com. (Doc. ID: 2418844)

Environmentalists, however, say the study's narrow focus on treatment plants may address concerns in Pennsylvania and other eastern states where geologic conditions prohibit operators from injecting their wastewater underground, but it would not assess the risks of the more widely used disposal practice of injecting wastewater from fracking into underground injection control (UIC) wells.

In the western United States, for example, produced water, the natural brine dredged up during fracking, and flowback, which refers to sometimes-contaminated remnants of the water injected during fracking, are generally disposed of in UIC wells.

Although wastewater disposal to wells regulated by EPA's UIC program is not used in all oil- and gas-producing states because of geological differences, it is generally regarded by the agency and industry as the preferred option for accommodating the massive volumes of waste produced by fracking operations.

But environmentalists say the disposal is not adequately regulated because the agency has long exempted oil and gas wastewater from hazardous waste regulation. The result of the exclusion is that it has allowed the wells to be handled as lesser-regulated Class II wastewater disposal wells, rather than more strictly regulated Class I wells.

Of particular concern for environmentalists is that the agency's UIC rules do not require permit writers to consider potential seismic risks when permitting Class II wells -- though a series of earthquakes tied to fracking wastewater disposal in Ohio has brought renewed attention to the issue.

To address this, environmentalists are petitioning EPA to eliminate the exclusion, which will force the wastewater to be disposed of in more strictly regulated Class I wells that require consideration of potential seismic risks, rather than as Class II wastewater disposal wells, whose rules do not currently require consideration of possible seismic effects.

Meanwhile, oil and gas company Encana is reinvigorating its push for EPA to withdraw its landmark December 2011 draft report finding that the producer's Wyoming fracking operations likely contributed to groundwater contamination.

During a Dec. 6 call with reporters, Encana's David Stewart reiterated the company's previous criticisms of EPA's groundwater study, including that the agency's geological assessment of the Pavillion, WY, shale formation is flawed, that EPA used constituents in its monitoring process that could have contaminated the laboratory findings and that the agency failed to fully investigate palatability concerns of citizens living near the drilling site. Stewart referred to the study as "sloppy work in the field and in the lab," and said EPA and other agencies should halt any plans to conduct further tests from the agency-prepared monitoring wells.

An Encana spokesman previously told Inside EPA that the Wyoming study raises industry concerns about EPA's methodology for conducting the larger two-year study, saying, "If this is the template for how they want to go about it, that's frightening."

The draft report represents the first time EPA has publicly indicated that the fracking injection process could have contaminated a drinking water aquifer, as opposed to poor cementing or other aspects of natural gas drilling. -- Bridget DiCosmo

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Colorado Oil And Gas Industry Under Pressure As Protests Mount
Huffington Post, The

12/17/2012

In this Dec. 5, 2012 photo, the sun sets behind an oil pump jack and the Rocky Mountains near Fredrick, Colo. (AP Photo/Ed Andrieski)

COLORADO SPRINGS, Colo. (AP) – This used to be a land proud of its oil barons. Now the energy industry that has brought wealth and jobs across the interior West is prompting angry protests by citizens sporting gas masks and using bullhorns at public hearings.

A generation after the fictional oil tycoons of the TV soap "Dynasty" gave Denver's oil and gas industry a glamorous sheen, the Rocky Mountain region appears to be questioning its romance with the industry. New drilling technology has moved oil and gas production from the sparsely populated plains, where oil rigs are embraced as job creators, closer to cities and suburbs. Now, conflicts are increasing along the populous eastern fringe of the Rockies.

Gas-mask-wearing protesters are confronting city and county officials considering whether to limit or ban hydraulic fracturing, a drilling procedure in which water, sand and chemicals are forced deep underground to pry oil and gas from rock. Fracking, as the procedure is called, has led to an energy boom in areas previously unattractive to energy producers, but it is also raising concerns about air and water quality.

The protests in Colorado have gotten intense. At hearings across the state, shouting opponents harass oil and gas representatives. Even Colorado's governor, a Democrat and former geologist who says fracking is safe, has been mobbed by protesters. Leaving a suburban Denver meeting about drilling earlier this fall, Gov. John Hickenlooper ducked into an SUV and pulled away as a crowd of protesters, some of them children, chanted, "Dirty water, dirty air, we get sick and you don't care!"

Opposition to fracking has also surfaced in Idaho, New Mexico, Utah and Wyoming. The U.S. Environmental Protection Agency has probed whether the procedure may be responsible for groundwater contamination near the Wyoming town of Pavillion. State officials and others have disputed that claim.

The West's anti-fracking movement hit a watershed moment in a Denver suburb in this year's elections. Longmont, a town of about 85,000 located 30 miles from Denver, voted overwhelmingly to buck state law and prohibit fracking in the city, setting up a legal showdown over whether individual communities can challenge the powerful Colorado Oil & Gas Conservation Commission, which regulates the industry statewide.

The vote inspired other fracking opponents from Fort Collins to Colorado Springs – and underscores the energy industry's challenge as it looks to expand into new production areas.

"It's the classic case ... of where you stand depends on where you sit," said David Kennedy, head of the Bill Lane Center for the American West at Stanford University. "The historic battle in the West has been the cities and the farmers. Now it's the cities, farmers and the frackers, all battling for water."

The battle is one fracking opponents say they can win, despite a legacy of pro-drilling policies across the state and region.

"We're an oil and gas state. We know that. We're going up against a huge industry," said Neshama Abraham, a freelance writer in Boulder who has helped lead fracking opposition in her county. "This is tremendously dangerous technology that is at our front door."

The "fracktivists" are making noise even in heavily Republican areas. At a recent city council meeting in Colorado Springs, fracking protesters waved signs warning of environmental destruction while passing drivers honked their support. "You can't drink oil," read one poster.

"I think Longmont gave people hope that it is possible to take on this industry," said Laurel Biedermann, a fracking skeptic in Colorado Springs. "We don't have to bend over and be a doormat for this industry."

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The Colorado Springs council has postponed a final vote on drilling regulations. In Fort Collins, city officials put a six-month moratorium on fracking after a public hearing in which residents sought the delay.

Fracking proponent Justin Williams, owner of Colorado-based Lone Star Energy, argued at the Colorado Springs council meeting that cities are foolish to try to stop the procedure. Fracking is necessary, he said, because of the nation's energy appetite.

"This demand is unquenchable. If we don't produce it here, it'll be done in countries employing 15-year-olds to do it," Williams said.

Another drilling supporter decried what he calls a "mob mentality" by anti-fracking activists. Former Colorado Springs councilman Sean Paige, now with Colorado's chapter of the right-leaning Americans For Prosperity, said he's disheartened by the new intense tone from opponents. Paige wrote a letter to Colorado governor's calling for more civility after recent boisterous protests.

"There's more conflict," he said, "than ever before."

The dispute will soon shift to the Colorado Capitol, where lawmakers have tried and failed to ease drilling disputes.

During the last legislative session that ended in May, the fracking debate broke down completely. Some Democrats proposed bills to add new environmental requirements for the industry, or to give towns more say over drilling regulations. Republicans countered with proposals that would have stripped any town that banned the drilling procedure of certain tax benefits.

Ultimately Colorado's Democratic Senate and Republican House agreed on nothing related to drilling.

The session that begins next month could be different. With both chambers under Democratic control, fracking limits are likely to be debated again.

"People don't want an industrial process going right across their fence," said Rep. Max Tyler, a Democrat from Denver's western suburbs who will lead a House committee likely to consider drilling regulations next year. "We'll definitely be talking about this."

Find Kristen Wyatt at http://www.twitter.com/APkristenwyatt

State Lawmakers And Environmental Activists Express Opposition To Hydro Fracking

NEW YORK, NY - JANUARY 11: Opponents of hydraulic fracturing in New York state attend a news conference and rally against hydraulic fracturing, also known as fracking, on January 11, 2012 in New York City. The event, which was held on the steps of City Hall, called for an end to the controversial gas drilling method as environmental groups increasingly warn about contamination of the state's aquifers that could poison its drinking water. (Photo by Spencer Platt/Getty Images)

State Lawmakers And Environmental Activists Express Opposition To Hydro Fracking

NEW YORK, NY - JANUARY 11: Eric Weltman of Food & Water Watch attends a news conference and rally against hydraulic fracturing, also known as fracking, in New York State on January 11, 2012 in New York City. The event, which was held on the steps of City Hall, called for an end to the controversial gas drilling method as environmental groups increasingly warn about contamination of the state's aquifers that could poison its drinking water. (Photo by Spencer Platt/Getty Images)

Department Of Environmental Conservation Holds Hydro Fracking Hearing

NEW YORK, NY - NOVEMBER 30: Opponents and supporters of gas-drilling, or fracking, walk into the last of four public hearings on proposed fracking regulations in upstate New York on November 30, 2011 in New York City. Fracking, a process that injects millions of gallons of chemical mixed water into a well in order to release gas, has become a contentious issue in New York as critics of the process belive it contaminates drinking water among other hazards. NewYork City gets much of its drinking water from upstate reservoirs. If the regulations are approved, drilling in the upstate New York Marcellus Shale could begin next year. (Photo by Spencer Platt/Getty Images)

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Cuadrilla Shale Fracking Plant

PRESTON, LANCASHIRE - OCTOBER 07: Engineers on the drilling platform of the Cuadrilla shale fracking facility on October 7, 2012 in Preston, Lancashire. The controversial method of extracting gas by pumping high pressure water and chemicals into shale formations deep underground has been blamed for two minor earthquakes in the surrounding region. Environmental campaigners are calling for a halt to the drilling of what Cuadrilla believe could be significant reserves of natural gas. (Photo by Matthew Lloyd/Getty Images)

Cuadrilla Shale Fracking Plant

PRESTON, LANCASHIRE - OCTOBER 07: Engineers at work on the drilling platform of the Cuadrilla shale fracking facility on October 7, 2012 in Preston, Lancashire. The controversial method of extracting gas by pumping high pressure water and chemicals into shale formations deep underground has been blamed for two minor earthquakes in the surrounding region. Environmental campaigners are calling for a halt to the drilling of what Cuadrilla believe could be significant reserves of natural gas. (Photo by Matthew Lloyd/Getty Images)

Cuadrilla Shale Fracking Plant

PRESTON, LANCASHIRE - OCTOBER 07: General views of the Cuadrilla shale fracking facility on October 7, 2012 in Preston, Lancashire. The controversial method of extracting gas by pumping high pressure water and chemicals into shale formations deep underground has been blamed for two minor earthquakes in the surrounding region. Environmental campaigners are calling for a halt to the drilling of what Cuadrilla believe could be significant reserves of natural gas. (Photo by Matthew Lloyd/Getty Images)

Cuadrilla Shale Fracking Plant

PRESTON, LANCASHIRE - OCTOBER 07: Engineers look at the Cuadrilla shale fracking facility on October 7, 2012 in Preston, Lancashire. The controversial method of extracting gas by pumping high pressure water and chemicals into shale formations deep underground has been blamed for two minor earthquakes in the surrounding region. Environmental campaigners are calling for a halt to the drilling of what Cuadrilla believe could be significant reserves of natural gas. (Photo by Matthew Lloyd/Getty Images)

Cuadrilla Shale Fracking Plant

PRESTON, LANCASHIRE - OCTOBER 07: A lump of shale rock on display at the Cuadrilla shale fracking facility on October 7, 2012 in Preston, Lancashire. The controversial method of extracting gas by pumping high pressure water and chemicals into shale formations deep underground has been blamed for two minor earthquakes in the surrounding region. Environmental campaigners are calling for a halt to the drilling of what Cuadrilla believe could be significant reserves of natural gas. (Photo by Matthew Lloyd/Getty Images)

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Cuadrilla Shale Fracking Plant

PRESTON, LANCASHIRE - OCTOBER 07: Drill heads on display at the entrance to the Cuadrilla shale fracking facility on

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October 7, 2012 in Preston, Lancashire. The controversial method of extracting gas by pumping high pressure water and chemicals into shale formations deep underground has been blamed for two minor earthquakes in the surrounding region. Environmental campaigners are calling for a halt to the drilling of what Cuadrilla believe could be significant reserves of natural gas. (Photo by Matthew Lloyd/Getty Images)

Cuadrilla Shale Fracking Plant

PRESTON, LANCASHIRE - OCTOBER 07: An engineer displays a lump of shale rock at the Cuadrilla shale fracking facility on October 7, 2012 in Preston, Lancashire. The controversial method of extracting gas by pumping high pressure water and chemicals into shale formations deep underground has been blamed for two minor earthquakes in the surrounding region. Environmental campaigners are calling for a halt to the drilling of what Cuadrilla believe could be significant reserves of natural gas. (Photo by Matthew Lloyd/Getty Images)

Hydraulic Fracturing Prevention Press Conference

NEW YORK, NY - APRIL 25: Actor/director Mark Ruffalo (C) speaks at the Hydraulic Fracturing prevention press conference urging the protection of the drinking water source of 15 million Americans at Foley Square on April 25, 2011 in New York City. (Photo by D Dipasupil/Getty Images)

Hydraulic Fracturing Prevention Press Conference

NEW YORK, NY - APRIL 25: (L-R) Actor/director Mark Ruffalo, Denise Katzman, Wenonah Hauter, and Water Defense co-founder/campaign director Claire Sandberg attend the Hydraulic Fracturing prevention press conference urging the protection of the drinking water source of 15 million Americans at Foley Square on April 25, 2011 in New York City. (Photo by D Dipasupil/Getty Images)

Josh Fox on Obama, the EPA, and House Republicans Who Had Him Arrested

HuffPost Green Editor Joanna Zelman talks to Josh Fox, director of the documentary 'Gasland,' about hydro-fracking, the EPA, and the House Republicans who had him arrested during a Congressional hearing.

Game Changer in Green: Mark Ruffalo

The expertise and the grassroots zeal Mark Ruffalo has brought to the issue of fracking is changing the game in green.

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Resources for Unconventional Gas and Hydraulic Fracturing
Environmental Law Professors

12/17/2012

« Rethinking Sustainable Development, ELC Essay #11: Sustainability is the Answer--Now What was the Question? | Main

As 2012 draws to a close, I offer a partial list of some of the best resources for learning, teaching, and writing about drilling and fracturing for natural gas.

1. Opinion section: The biggest threat posed by domestic natural gas may be the displacement of renewables and the associated demise of climate solutions.

Abundant natural gas--the cleaner fossil fuelin terms of greenhouse gases and conventional pollutants--may ultimately lead to the demise of climate goals. In 2012, when the International Energy Agency reported that the United States would become "self sufficient" in energy by 2035 and would possibly become the world's largest producer of oil, its Chief Economist, Faith Birol, also issued dire warnings: Because of the U.S fascination with shale gas and oil, and our new knowledge that we have abundant, accessible unconventional fossil resources, we are ignoring the climate problem and forgetting the urgent need to build renewables. "Climate change has been slipping down the agenda," he said. "It is not having a significant impact on energy investors." Birol concluded: "I don't see much reason to be hopeful that we will see reductions in carbon dioxide. . . . We have seen more carbon dioxide emitted this year." The warning, then, is that the United States will remain blindly optimistic as we wallow in a sea of abundant oil and gas--so blind, in fact, that we will ignore our shrinking coastlines and vanishing species. The solution is not to ignore or stop extracting gas: It has displaced coal at a rapid rate and has reduced energy-related greenhouse gas emissionsin the United States; it's also cheap. But we must continue building renewable generation at a rapid rate; natural gas is supposed to be a bridge to something more sustainable, and if we miss that essential point, we will fail to address what may be the greatest threat to the health of our planet. The abundance and cheap price of gas--particularly in the absence of a carbon tax to accurately price the impacts of fossil fuels--could make it increasingly difficult to maintain a renewable energy focus. This is unfortunate, particularly in light of the fact that natural gas and renewables make a natural pair; gas plants, which can start up rapidly, are a key back-up source for intermittent renewables.

2.Section on natural gas and environmental impact "facts" (Warning: the facts in this area change quickly). 2a. the numbers

International Energy Agency2012: The United States is likely to be self sufficient in energy by 2035 and a major exporter of energy, whereas many other countries will import from us. This does not make us "energy secure," however, as fuels, like other goods, are part of a global market. As the IEA reminds us, "No country is an energy 'island' and the interactions between different fuels, markets and prices are intensifying." (This report is worth getting from your library.)

Energy Information Administration 2012: "As of January 1, 2010, total proved and unproved natural gas resources are estimated at 2,203 trillion cubic feet," but this number changes frequently and is much disputed.

By 2035, the EIA projects that shale gas will account "for 49 percent of total U.S. natural gas production."

There are approximately 16,346 shale gas wells in the Barnett Shale of North Central Texas. There are approximately 1,483 producing gas wells within the City of Fort Worth.

Energy companies have registered approximately 33,277 well sites on FracFocus, the website on which companies voluntarily report chemicals used in hydraulic fracturing.

In 2010, the states with the largest shale gas production numbers included Texas, Louisiana, Arkansas, Oklahoma, and Pennsylvania.

2b. The global gas situation

On December 13, 2012, the British government decided to allow hydraulic fracturing for natural gas within the United

Kingdom.

In September 2012, South Africa lifted a ban on fracturing in one region.

In the following Energy Information Administration map, red areas have been studied most closely.

2c. Useful risk assessments from the United States

One of the most comprehensive assessments of the effects of drilling and fracturing: New York Department of Environmental Conservation Revised Draft Supplemental Generic Environmental Impact Statement on the Oil, Gas, and Solution Mining Program (exploring most of the effects but ignoring the impacts of seismic testing to locate gas underground).

One of the best, brief summaries of drilling and fracturing risks begins on page 3 of the U.S. Fish and Wildlife Service document "Summary of Oil and Gas Development, Hydraulic Fracturing and Issues Associated with Conservation of U.S. Fish and Wildlife Service Trust Resources in the Southwest Region."

The Government Accountability Office, in two reportsthat examine the scientific studies to date, has concluded that we cannot currently quantify fracturing risks from the sparse data currently available.

Rozell and Reaven, Water Pollution Risks Associated with Natural Gas Extraction from the Marcellus Shal (estimating the likely total volume of spills).

Wisconsin Department of Natural Resources, Silica Sand Mining in Wisconsin (describing the environmental impacts of mining sand for fracturing proppant).

Two Duke studies: potential methane contamination of groundwater from drilling and fracturing, and potential contamination of groundwater with brine (naturally produced salty water from formations).

Reply by Richard Davies arguing that methane contamination is unproven.

Duke scientists' to Davies.

EPA Pavillion, Wyoming report on potential contamination of groundwater with fracturing fluids.

For excellent information on chemicals in fracturing, see the EPA's Proceedings of the Technical Workshops for the Hydraulic Fracturing Study: Chemical & Analytical Methods. See also the Congressional report "Chemicals Used in Hydraulic Fracturing."

The EPA has evaluated the potential impact of fracturing wastes on microbial processes in wastewater treatment plants.

The U.S. Fish and Wildlife Service has a brief discussion of the impacts of natural gas drilling and fracturing on fish and wildlife.

Earthquakes caused by underground injection control wells for the disposal of oil and gas wastes: see Ohio Department of Natural Resources Youngstown report and the Oklahoma Geological Survey report by Austin Holland.

The Texas Water Development Board has a good report on water use in the Barnett Shale.

WorldWatch has a good comparison of lifecycle studies addressing methane emissions from gas development.

2d. Recent regulation and associated legal action

Federal

EPA's final Clean Air Act rules: NSPS for volatile organic compounds from newly fractured and refractured wells; NSPS for sulfur dioxide emissions from gas processing plants and for VOCs from various compressors and storage vessels used in oil and gas production. The American Petroleum Institute claims that the rules will be very expensive and will slow down unconventional development--a familiar industry response, of course, to most environmental regulations.

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On December 11, 2012, seven states issued an intent to sue EPA for failure to control methane from oil and gas production.

BLM has proposed fracturing rules for federal and Indian lands, which would require, among other things, testing mechanical integrity of the well before fracturing to ensure that the well can withstand fracturing pressures, continuous monitoring of well pressures during fracturing, reporting of chemicals used, and reporting of total volumes of water used and quantities and methods of waste handling and disposal.

Hydraulic fracturing using diesel fuel--a practice that still occurs--is not exempt from the Safe Drinking Water Act, unlike other types of fracturing. The EPA has issued draft guidancefor this type of fracturing, which would require, among other things, that permit writers consider potential interaction of the fuel with the formation into which it is injected as well as potential reactions that could occur after injection, and a plan for cementing casing (lining) into a well that would "ensure proper cement design and volume." The guidance would also more broadly define diesel to include kerosene, home heating oils, automotive diesel fuel, and others.

In October 2011 the EPA initiated a Clean Water Act rulemaking process "to set discharge standards for wastewater from shale gas extraction."

The EPA is continuing its study of the impacts of hydraulic fracturing (primarily fracturing in shales) on water and is hosting a number of technical roundtables and workshops in 2012 and 2013.

State and regional

The New York Department of Environmental Conservation has issued proposed rules for drilling and fracturing with high volumes of water. The public comment period ends on January 11, 2013.

Texas, which has long resisted revising most of its oil and gas rules despite a major rise in shale gas well numbers, has proposed revisions to its casing regulations and other rules. The Railroad Commission (the state's oil and gas agency) also has, as required by the state legislature, issued rules requiring the disclosureof chemicals used in fracturing.

Oklahoma, Mississippi, and a number of other states also have adopted disclosure rules.

Montanachanged some of its oil and gas rules to address fracturing, and North Dakota has proposed a similar revision.

Colorado (follow “Rules” hyperlink in blue menu to the left of the page, then follow “2008 Rulemaking” hyperlink, then follow “COGCC Amended Rules Redline”), Ohio (particularly for urbanized areas), Pennsylvania (through several different acts and rulemakings), and West Virginia have made some of the most comprehensive changes to their oil and gas codes.

The Delaware River Basin Commission proposed somewhat extensive rulesfor well site development, drilling, and fracturing within the Delaware River watershed, but the rules have not yet been finalized. New York's attempt to require a NEPA environmental impact statement before the rules were released failed due to a lack of standing, but the judge made it clear that once the rules were finalized, the state could probably return to court. 2012 WL 4336701.

Preemption: Pennsylvania attempted to remove municipalities' authority over many aspects of drilling and fracturing by requiring them to allow the practice in most zones, in exchange for more protective state environmental regulation. The Commonwealth, which had long refused to impose a severance tax on gas, also provided that municipalities could charge an unconventional gas well fee, the proceeds of which would go to a central fund that would be redistributed to fund road infrastructure, environmental clean-up, and other projects. A divided Commonwealth Court of Pennsylvania found that the Act essentially forced municipalities to violate their comprehensive plans and declared portions of the Act null and void. The state's supreme court has heard oral argument. Robinson Twp. v. Commonwealth of Pennsylvania, 52 A.3d 463 (Pa. Cmwlth. 2012).

Colorado's governor instituted a task force on municipal-state relations in regulating natural gas. The task force issued recommendations, but the state has threatened to sue the town of Longmont, which banned fracturing.

Ordinances in Fort Worth,Texas and Farmington, New Mexico (see Chapter 19, Oil and Gas Wells) provide examples of relatively comprehensive local ordinances that address drilling and fracturing.

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Several New York courts have allowed towns to ban fracturing despite generally preemptive language in the state's Oil, Gas, and Solution Mining Law, which supersedes "all local laws or ordinances relating to the regulation of the oil, gas, and solution mining industries." N.Y. ENV. LAW § 23-0303. Municipalities wishing to avoid preemption must apparently write their gas regulations as land use laws that happen to limit (or ban) gas development--these, the courts have said, don't "relate to the regulation of . . . gas" but rather to the regulation of land use. See, e.g., Anschutz Exploration v. Town of Dryden (NY 2012). For more discussion of federalism in fracking, see my other .

The University of Colorado's Intermountain Oil and Gas BMP Projectcollects regulations from several states, as does FracFocus. FracFocus adds some editorialization to its regulatory summaries, however, arguing, "The best-suited regulators of hydraulic fracturing are the states." The website is run by the Ground Water Protection Council, a nonprofit association of state regulators, which has spoken out against federal regulation of fracturing in certain areas, and the Interstate Oil and Gas CompactCommission, which receives industry funding for certain events and more clearly opposes federal regulation of fracturing and oil and gas development.

Common law: For a good summary of fracturing litigation, see Keith Hall and Lauren Godshall's article in "The Advocate." The Texas Supreme Court in Coastal Oil & Gas v. Garza held that Garza could not obtain trespass damages for fractures into a formation that drained the gas from the formation; the issue remains open in other states. Plaintiffs in Pennsylvania have alleged nuisance, negligence, trespass, and strict liability, among other claims, as a result of contamination from drilling and fracturing. The courts, which have not yet had the opportunity to reach the substance of these claims in the cases I'm aware of, have noted that it is not yet clear whether gas drilling is an abnormally dangerous activity in Pennsylvania. See, e.g., Fiorentino v. Cabot, 750 F.Supp.2d 506 (M.D. Pa. 2010). Federal district courts addressing cases that arise in Arkansas also have not yet determined whether fracking is abnormally dangerous. See, e.g., Tucker v. Southwestern Energy Co., 2012 WL 528253 (E.D. Ark. 2012).

2e. Data on enforcement of oil and gas and environmental laws at well sites, and types of violations

The Arkansas Public Policy Panel found a number of stormwater violations at Fayetteville Shale sites.

The Pennsylvania Department of Environmental Protection's compliance database allows you to create spreadsheets of all violations at Marcellus Shale sites (select "Oil and Gas Compliance Report" from the menu on the right. From the dropdown menu, select "unconventional only" "Yes.").

The New Mexico Oil Conservation Division has a spill database and a list of oil and gas pits that have caused underground water contamination.

I've begun to try to collectand analyze databut am still in the very early stages.

2f. Fracking theory

Professor David Spence, University of Texas, has a great piece on federalism in fracking, arguing that many of the effects are local and that for impacts that don't cross state lines, local control is generally good.

Professor Michael Burger has an excellent reply to Spence forthcoming in PENNumbra.

In an op-ed, Professor Jody Freeman has argued for implementation of federal fracturing standards with a cooperative federalism approach.

I'm working on a piece that argues that when regulations are written, rule writers balance the cost of regulation against anticipated harms with a certain scale of activity in mind, and they fail to anticipate or automatically account for needed regulatory changes when scale rapidly changes, as has occurred with drilling and fracturing. Agencies and regulations need to better project scalar change and include automatic provisions for seamless transitions to new scales, including automatic increases in agency staffing and provisions to address potential threshold and interactive effects as activities expand in scale. I'll post this on SSRN soon and will welcome critiques and suggestions.

3. Best practices and needed regulatory changes

The Marcellus Shale Advisory Commission Final Report made a number of recommendations for changes, such as increasing civil penalties for well violations and improving various casing and substantive requirements, many of which

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Pennsylvania adopted in the disputed Act 13 (House Bill 1950).

The Secretary of Energy Advisory Board Shale Gas Production Subcommittee 90-day report recommends, among other things, disclosure of fracturing fluids, not using diesel in fracturing and reducing the use of diesel in drilling and fracturing equipment, and "managing short-term and cumulative impacts on communities, land use, wildlife, and ecologies." The final reportmakes similar and more detailed recommendations.

The State Review of Oil and Natural Gas Environmental Regulations--a public-private group that took on the responsibilities of a predecessor group after the EPA exempted most oil and gas wastes from Subtitle C of the Resource Conservation and Recovery Act--has guidelines for hydraulic fracturingand drilling. It has conducted a number of voluntary reviews of states' hydraulic fracturing regulations (for the states that have agreed to be reviewed) and has recommended improvements in regulation and enforcement.

The American Petroleum Institute has a number of standards and guidelines for drilling and fracturing, including, for example, "Water Management Associated with Hydraulic Fracturing."

This is only a partial list, but I hope that it's useful. Happy holidays to all.

--Hannah Wiseman

http://www.typepad.com/services/trackback/6a00d8341bfae553ef017c 349a7b09970b

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Poisoning the Well: How the Feds Let Industry Pollute the Nation's Underground Water Supply
NationofChange

12/16/2012

Now, as commercial crops wilt in the dry heat and winds rip the dust loose from American prairies, questions are mounting about whether the EPA should continue to grant exemptions going forward.

Federal officials have given energy and mining companies permission to pollute aquifers in more than 1,500 places across the country, releasing toxic material into underground reservoirs that help supply more than half of the nation's drinking water.

In many cases, the Environmental Protection Agency has granted these so-called aquifer exemptions in Western states now stricken by drought and increasingly desperate for water.

EPA records show that portions of at least 100 drinking water aquifers have been written off because exemptions have allowed them to be used as dumping grounds.

"You are sacrificing these aquifers," said Mark Williams, a hydrologist at the University of Colorado and a member of a National Science Foundation team studying the effects of energy development on the environment. "By definition, you are putting pollution into them. ... If you are looking 50 to 100 years down the road, this is not a good way to go."

As part of an investigation into the threat to water supplies from underground injection of waste, ProPublica set out to identify which aquifers have been polluted.

We found the EPA has not even kept track of exactly how many exemptions it has issued, where they are, or whom they might affect.

What records the agency was able to supply under the Freedom of Information Act show that exemptions are often issued in apparent conflict with the EPA's mandate to protect waters that may be used for drinking.

Though hundreds of exemptions are for lower-quality water of questionable use, many allow grantees to contaminate water so pure it would barely need filtration, or that is treatable using modern technology.

The EPA is only supposed to issue exemptions if aquifers are too remote, too dirty, or too deep to supply affordable drinking water. Applicants must persuade the government that the water is not being used as drinking water and that it never will be.

Sometimes, however, the agency has issued permits for portions of reservoirs that are in use, assuming contaminants will stay within the finite area exempted.

In Wyoming, people are drawing on the same water source for drinking, irrigation and livestock that, about a mile away, is being fouled with federal permission. In Texas, EPA officials are evaluating an exemption for a uranium mine – already approved by the state – even though numerous homes draw water from just outside the underground boundaries outlined in the mining company's application.

The EPA declined repeated requests for interviews for this story, but sent a written response saying exemptions have been issued responsibly, under a process that ensures contaminants remain confined.

"Aquifer Exemptions identify those waters that do not currently serve as a source of drinking water and will not serve as a source of drinking water in the future and, thus, do not need to be protected," an EPA spokesperson wrote in an email statement. "The process of exempting aquifers includes steps that minimize the possibility that future drinking water supplies are endangered."

Yet EPA officials say the agency has quietly assembled an unofficial internal task force to re-evaluate its aquifer exemption policies. The agency's spokesperson declined to give details on the group's work, but insiders say it is

attempting to inventory exemptions and to determine whether aquifers should go unprotected in the future, with the value of water rising along with demand for exemptions closer to areas where people live.

Advances in geological sciences have deepened regulators' concerns about exemptions, challenging the notion that waste injected underground will stay inside the tightly drawn boundaries of the exempted areas.

"What they don't often consider is whether that waste will flow outside that zone of influence over time, and there is no doubt that it will," said Mike Wireman, a senior hydrologist with the EPA who has worked with the World Bank on global water supply issues. "Over decades, that water could discharge into a stream. It could seep into a well. If you are a rancher out there and you want to put a well in, it's difficult to find out if there is an exempted aquifer underneath your property."

Aquifer exemptions are a little-known aspect of the government's Underground Injection Control program, which is designed to protect water supplies from the underground disposal of waste.

The Safe Drinking Water Act explicitly prohibits injection into a source of drinking water, and requires precautions to ensure that oil and gas and disposal wells that run through them are carefully engineered not to leak.

Areas covered by exemptions are stripped of some of these protections, however. Waste can be discarded into them freely, and wells that run through them need not meet all standards used to prevent pollution. In many cases, no water monitoring or long-term study is required.

The recent surge in domestic drilling and rush for uranium has brought a spike in exemption applications, as well as political pressure not to block or delay them, EPA officials told ProPublica.

"The energy policy in the U.S is keeping this from happening because right now nobody –nobody – wants to interfere with the development of oil and gas or uranium," said a senior EPA employee who declined to be identified because of the sensitivity of the subject. "The political pressure is huge not to slow that down."

Many of the exemption permits, records show, have been issued in regions where water is needed most and where intense political debates are underway to decide how to fairly allocate limited water resources.

In drought-stricken Texas, communities are looking to treat brackish aquifers beneath the surface because they have run out of better options and several cities, including San Antonio and El Paso, are considering whether to build new desalinization plants for as much as $100 million apiece.

And yet environmental officials have granted more than 50 exemptions for waste disposal and uranium mining in Texas, records show. The most recent was issued in September.

The Texas Railroad Commission, the state agency that regulates oil and gas drilling, said it issued additional exemptions, covering large swaths of aquifers underlying the state, when it brought its rules into compliance with the federal Safe Drinking Water Act in 1982. This was in large part because officials viewed them as oil reservoirs and thought they were already contaminated. But it is unclear where, and how extensive, those exemptions are.

EPA "Region VI received a road map – yes, the kind they used to give free at gas stations – with the aquifers delineated, with no detail on depth," said Mario Salazar, a former EPA project engineer who worked with the underground injection program for 25 years and oversaw the approval of Texas' program, in an email.

In California, where nearly half of the nation's fruits and vegetables are grown with water from as far away as the Colorado River, the perennially cash-strapped state's governor is proposing to spend $14 billion to divert more of the Sacramento River from the north to the south. Near Bakersfield, a private project is underway to build a water bank, essentially an artificial aquifer.

Still, more than 100 exemptions for natural aquifers have been granted in California, some to dispose of drilling and fracking waste in the state's driest parts. Though most date back to the 1980s, the most recent exemption was approved in 2009 in Kern County, an agricultural heartland that is the epicenter of some of the state's most volatile rivalries over water.

The balance is even more delicate in Colorado. Growth in the Denver metro area has been stubbornly restrained not by

available land, but by the limits of aquifers that have been drawn down by as much as 300 vertical feet. Much of Eastern Colorado's water has long been piped underneath the Continental Divide and, until recently, the region was mulling a $3 billion plan to build a pipeline to bring water hundreds of miles from western Wyoming.

Along with Wyoming, Montana and Utah, however, Colorado has sacrificed more of its aquifer resources than any other part of the country.

More than 1,100 aquifer exemptions have been approved by the EPA's Rocky Mountain regional office, according to a list the agency provided to ProPublica. Many of them are relatively shallow and some are in the same geologic formations containing aquifers relied on by Denver metro residents, though the boundaries are several hundred miles away. More than a dozen exemptions are in waters that might not even need to be treated in order to drink.

"It's short-sighted," said Tom Curtis, the deputy executive director of the American Water Works Association, an international non-governmental drinking water organization. "It's something that future generations may question."

To the resource industries, aquifer exemptions are essential. Oil and gas drilling waste has to go somewhere and in certain parts of the country, there are few alternatives to injecting it into porous rock that also contains water, drilling companies say. In many places, the same layers of rock that contain oil or gas also contain water, and that water is likely to already contain pollutants such as benzene from the natural hydrocarbons within it.

Similarly, the uranium mining industry works by prompting chemical reactions that separate out minerals within the aquifers themselves; the mining can't happen without the pollution.

When regulations governing waste injection were written in the 1980s to protect underground water reserves, industry sought the exemptions as a compromise. The intent was to acknowledge that many deep waters might not be worth protecting even though they technically met the definition of drinking water.

"The concept of aquifer exemptions was something that we 'invented' to address comments when the regulations were first proposed," Salazar, the former EPA official, said. "There was never the intention to exempt aquifers just because they could contain, or would obviate, the development of a resource. Water was the resource that would be protected above all."

Since then, however, approving exemptions has become the norm. In an email, the EPA said that some exemption applications had been denied, but provided no details about how many or which ones. State regulators in Texas and Wyoming could not recall a single application that had been turned down and industry representatives said they had come to expect swift approval.

"Historically they have been fairly routinely granting aquifer exemptions," said Richard Clement, the chief executive of Powertech Uranium, which is currently seeking permits for new mining in South Dakota. "There has never been a case that I'm aware of that it has not been done."

In 1981, shortly after the first exemption rules were set, the EPA lowered the bar for exemptions as part of settling a lawsuit filed by the American Petroleum Institute. Since then, the agency has issued permits for water not "reasonably expected" to be used for drinking. The original language allowed exemptions only for water that could never be used.

Oil companies have been the biggest users of aquifer exemptions by far. Most are held by smaller, independent companies, but Chevron, America's second-largest oil company, holds at least 28 aquifer exemptions. Exxon holds at least 14. In Wyoming, the Canadian oil giant EnCana, currently embroiled in an investigation of water contamination related to fracking in the town of Pavillion, has been allowed to inject into aquifers at 38 sites.

Once an exemption is issued, it's all but permanent; none have ever been reversed. Permits dictate how much material companies can inject and where, but impose little or no obligations to protect the surrounding water if it has been exempted. The EPA and state environmental agencies require applicants to assess the quality of reservoirs and to do some basic modeling to show where contaminants should end up. But in most cases there is no obligation, for example, to track what has been put into the earth or – except in the case of the uranium mines – to monitor where it does end up.

The biggest problem now, experts say, is that the EPA's criteria for evaluating applications are outdated. The rules – last revised nearly three decades ago – haven't adapted to improving water treatment technology and don't reflect the changing value and scarcity of fresh water.

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Aquifers once considered unusable can now be processed for drinking water at a reasonable price.

The law defines an underground source of drinking water as any water that has less than 10,000 parts per million of what are called Total Dissolved Solids, a standard measure of water quality, but historically, water with more than 3,000 TDS has been dismissed as too poor for drinking. It also has been taken for granted that, in most places, the deeper the aquifer – say, below about 2,000 feet – the higher the TDS and the less salvageable the water.

Yet today, Texas towns are treating water that has as high as 4,000 TDS and a Wyoming town is pumping from 8,500 feet deep, thousands of feet below aquifers that the EPA has determined were too far underground to ever produce useable water.

"You can just about treat anything nowadays," said Jorge Arroyo, an engineer and director of innovative water technologies at the Texas Water Development Board, which advises the state on groundwater management. Arroyo said he was unaware that so many Texas aquifers had been exempted, and that it would be feasible to treat many of them. Regarding the exemptions, he said, "With the advent of technology to treat some of this water, I think this is a prudent time to reconsider whether we allow them."

Now, as commercial crops wilt in the dry heat and winds rip the dust loose from American prairies, questions are mounting about whether the EPA should continue to grant exemptions going forward.

"Unless someone can build a clear case that this water cannot be used – we need to keep our groundwater clean," said Al Armendariz, a former regional administrator for the EPA's South Central region who now works with the Sierra Club. "We shouldn't be exempting aquifers unless we have no other choice. We should only exempt the aquifer if we are sure we are never going to use the water again."

Still, skeptics say fewer exemptions are unlikely, despite rising concern about them within the EPA, as the demand for space underground continues to grow. Long-term plans to slow climate change and clean up coal by sequestering carbon dioxide underground, for example, could further endanger aquifers, causing chemical reactions that lead to water contamination.

"Everyone wants clean water and everyone wants clean energy," said Richard Healy, a geologist with the U.S. Geological Survey whose work is focused on the nexus of energy production and water. "Energy development can occur very quickly because there is a lot of money involved. Environmental studies take longer."